

## **SMEX AO Q&A**

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This document may be found by selecting "SMEX AO Q&A" at  
<http://explorer.larc.nasa.gov/explorer/smexacq.html>

Questions answered at the SMEX Preproposal Conference may be found at  
<http://explorer.larc.nasa.gov/explorer/smexppconf03.html>

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### **Categories of Questions**

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## **SCIENCE (S)**

- S-1 Our proposal would be relevant to OSS through the Astrobiology and Planetary Protection programs. As I read the announcement, Astrobiology is covered in section 1.1. It is not clear if Planetary Protection is covered. Is it correct to assume that both of these programs are objectives of this announcement?**

As the AO clearly states in Section 1.1, NASA is soliciting space science investigations, where space science incorporates three (and only three) of the science themes in NASA's Office of Space Science: Astronomical Search for Origins, Sun-Earth Connection, and Structure and Evolution of the Universe. The AO also notes that the Astronomical Search for Origins includes astrobiology.

What is unfortunately ambiguous is that the Astronomical Search for Origins does not incorporate all of astrobiology. It doesn't even incorporate all of astrobiology that might be of interest to OSS. It only includes those astrobiology goals that are relevant to the goals and objectives of the Astronomical Search for Origins theme. This is stated in the AO in Section 2.1, "The scientific goals in these referenced documents, *as they relate to the NASA science themes* listed in Section 1.1, will form the basis of the science evaluation criteria" (emphasis added).

It is up to you, in your proposal, to make the case that the science objectives of your proposed investigation are of interest, not just to NASA, not just to the Office of Space Science, but specifically of interest to the Astronomical Search for Origins (or one of the other two themes solicited in this AO).

In particular, planetary protection is not an objective of the Astronomical Search for Origins theme.

## **PROPOSALS (P)**

- P-1a We wish to submit a proposal from a NASA center other than GSFC or JPL. Section 3.5.1 says that we cannot implement project management and end-to-end systems engineering functions at our center. Is it permissible for these functions to be performed by a contractor organization?**

Yes, these functions may be performed by a contractor organization. This does not mean that individual contractors working for a NASA center can perform the functions. Rather a contractor organization may perform these functions as part of the proposed management plan for the mission.

NASA has determined that GSFC and JPL are especially qualified to perform these functions for space science missions. A NASA center should have a compelling reason why these functions are better performed by a contractor organization than within NASA.

- P-1b We wish to submit a proposal from a NASA center other than GSFC or JPL. Section 3.5.1 says that we cannot implement project management and end-to-end systems engineering functions at our center. Will we be evaluated on our management scheme even though we are required to propose a less-than-ideal management structure?**

The criterion is not whether you have proposed an ideal management structure. The criterion is whether you can deliver the proposed project within the proposed resources (cost, schedule, technical, etc) using the proposed management scheme. The AO says (Section 7.2.4), "The technical and management approaches ... will be evaluated to assess the likelihood that the investigation can be implemented as proposed."

- P-2 What do you mean by “history and basis for the proposal?” (Appendix B, Section D.1)**

In general, this requests that the proposal explain the motivation for the proposed investigation. “History” refers to the history of the discipline, missions and investigations that have gone before, and the current state of the field. These provide the basis for the PI’s assertion that the proposed investigation is the right mission at this time.

**P-3 We would like to propose a co-manifested launch with an approved mission. However, to make our schedule compatible with their schedule, it would be necessary to accomplish a considerable amount of Phase B effort during the Phase A time frame. Is it possible in our May 2 proposal to propose immediate selection for a Phase B effort?**

No. This AO is a full and open solicitation for SMEX missions. The process that is laid out in the AO is a two-stage process, with a competitive Phase A. All proposals will be treated the same. Proposals for immediate selection of a full SMEX into Phase B are not solicited, nor will they be considered.

**P-4 Assume that I've submitted a proposal that has been selected for a phase A concept study. During the course of the study I determine that I've got to descope my mission to stay within the cost cap - with contingency. Does my science section get reevaluated during the Step 2 review process if the descope in science is within the bounds of the "baseline to minimum mission" scenario I proposed in my Step 1 proposal?**

Yes. The *Guidelines and Criteria for the Phase A Concept Study* document found in the Explorer Program Library says, "The science objectives must not change from those given in the proposal. Any changes to science implementation will be carefully evaluated." Changes to the baseline science objectives are not permitted; the compelling nature of those science objectives, as determined by the science peer review, is the most important factor in being selected to conduct a Phase A mission concept study. Any significant descoping during Phase A of the science implementation from the baseline science mission proposed in Step 1 will be cause for a reevaluation of the science objectives during the Step 2 evaluation process. Descoping during Phase A is typically not considered a positive characteristic of a mission that fits within its cost and schedule constraints.

**P-5 I heard that Dr. Weiler has imposed a new requirement: that all proposals must now have 25% contingency (Phases B/C/D minus launch vehicle) and 25% at confirmation review. Will this requirement be applied to the SMEX AO?**

No. That requirement will apply to future AO's, like the next MIDEX AO. The requirements for the SMEX solicitation are those given in the AO. Of course, if you want to make your contingency higher than 20% (like 25%) then you may. The adequacy of reserves is always a factor during evaluation and selection.

**P-6 Under what conditions could a Mission of Opportunity be selected without first completing a Phase A concept study? (Section 5.1)**

It is up to the Mission of Opportunity proposer to identify conditions that require selection prior to the completion of a Phase A study. NASA may or may not find these conditions sufficient.

**P-7 I believe I heard you say at the Preproposal Conference that Missions of Opportunity could be approved for Phase B, if such need were justified in the proposal. We would like to propose a Mission of Opportunity as an already approved payload on a foreign mission. However, in order to make our schedule compatible with their schedule, it would be necessary to accomplish a considerable amount of Phase B effort during the Phase A time frame. Is it possible in our May 2 proposal to propose immediate selection for a Phase B effort?**

I did not say that a MO could be approved for Phase B. Every project must complete the work that constitutes a Phase A concept study as one step of formulation. It is impossible to begin a preliminary design without first completing a concept study. A project cannot enter Phase B until it has completed Phase A and undergone a A-to-B initial confirmation review. The default for proposals selected through the SMEX AO is that they will all complete Phase A together, and the downselect process serves as the A-to-B initial confirmation review.

Section 5.1 of the AO says "A Mission of Opportunity may be selected for flight without first completing a Phase A concept study, or it may be required to conduct a Phase A concept study before being considered for flight." This means that a MO could be selected for flight and not required to undergo a competitive Phase A. It still must complete a Phase A concept study and be approved to enter Phase B. It must also undergo a confirmation review prior to being approved to enter Phase C/D. However it would not be required to complete that Phase A study on the same schedule as the other SMEX selections. You may propose a short Phase A followed by a short Phase B. NASA will evaluate whether the schedule you propose is realistic. NASA also will decide whether the justification that you give for being selected for flight is sufficient.

**P-8a An external PI is proposing a mission where GSFC scientists are Co-I's, and where the PI would like GSFC to provide project management. This PI has already teamed with an industrial partner. In the *GSFC Services* document in the Explorer Program Library, it describes how an external PI should go about getting management support from GSFC: "For Phase A concept studies, GSFC will provide support in these core competency areas to the extent required by the PI to complete the study. In addition, GSFC will also provide support in its project management core competency area during Phase A studies. Phase A support is provided on a full-cost basis. Of special note to all PIs is the fact that NASA procurement regulations require industry partners to be selected competitively if GSFC is to manage the mission. GSFC will require the PI to demonstrate that such a process has been or will be conducted prior to entering in to any teaming arrangement for the concept study."**

**I would have thought that the entire process of the PI and his industrial partner being selected under this AO would satisfy the competition requirement for GSFC to manage this. Why would the PI need to undergo another competition to select his teaming with his industrial partner?**

The language in the *GSFC Services* document in the Explorer Program Library has some ambiguous language in it. The document states, "Of special note to all PIs is the fact that NASA procurement regulations require industry partners to be selected competitively if GSFC is to manage the mission."

The phrase "manage the mission" does not refer to the GSFC project management services. If the PI is from a non-government institution (e.g., university), then the SMEX evaluation and selection serves as a competitive selection mechanism. Of course, if the PI is from GSFC, then Appendix 7, describing the competitive process used to select an industry partner, must be submitted with the proposal.

**P-8b Does an outside organization's competition satisfy the Government's requirement to compete a requirement where the Government awards a contract? Thus, in situations where an organization wants a NASA center to award a contract to a hardware supplier in order to management it, is the outside organization's competition sufficient?**

NFS 1872.502(a)(3) gives the Program AA, as selecting official, the authority to determine "whether the proposed instrument fabricator qualifies and should be accepted as a sole source or whether the requirement should be competitively procured."

There are a number of guidelines in NFS 1872.502(a)(3) upon which this determination should be made. You may provide the suggested information in a version of Appendix I-7, the one for government PI's. We will modify the next AO to mention this alternate version of Appendix I-7.

**P-9 If a NASA PI contracts the project management out for his SMEX, how is the project costing reported? Does it go to the PI, who then forwards it to the Explorer Program Office, or does it bypass the PI's center and go straight to the Explorer Program Office? Does the PI send his information to the contractor, who folds it in with the rest?**

The requirement is that project management not be provided by a NASA center other than GSFC or JPL. This requirement does not specify how your project costing is reported. In your proposal, you should specify the roles that the project leaders (e.g. PI, project manager) will play in your project. You should also propose a management organization and cost reporting process that has the best chance of leading to a successful science investigation.

## **LAUNCH VEHICLES (LV)**

**LV-1 Which cost chart in the *ELV Launch Services Information Summary* document should be used for an August 2007 launch?**

The cost charts in the *ELV Launch Services Information Summary* document depend only on the fiscal year of the launch. A launch in FY07, including August 2007, should use the chart labeled February 2007. A launch in FY08, including August 2008, should use the chart labeled February 2008. More accurate launch cost profiles will be tailored to a specific launch date during the Phase A concept study.

**LV-2 What range of inclination is included in the priced equatorial launch option for Pegasus?**

The equatorial launch option for Pegasus includes inclinations as low as 0 degrees (equatorial). Availability for specific flight patterns depends on range safety and overflight restrictions.

**LV-3 Please clarify what is and is not included in the GFE ELV cost and in the 20% ROM for Shuttle launch services. Specifically, is any level of mission unique services included in the ELV costs given in the Explorer Program Library?**

For ELV's, all mission specific, normally expected costs are included in the GFE cost. These are typically referred to as standard services. The GFE cost also includes KSC costs for providing mission launch services and adequate cost reserves for everything included within the GFE cost. The GFE cost also includes some normally expected mission uniques. If you have a requirement for a mission unique and you are not sure whether it is included within the GFE cost or not, please obtain a clarification from the POC given in the *ELV Launch Services Information Summary* document found in the Explorer Program Library.

The intent is the same for Shuttle launch services. The 20% ROM for the stage 1 proposal, and the more accurate cost that will be determined as part of a Phase A concept study, includes standard services associated with transportation, installation, and return to Earth of a ISS attached payload. Any mission unique services required beyond the standard services, such as astronaut EVA activities, must be costed above the 20% ROM. If you have a mission unique requirement, or you are not sure if your requirement is mission unique or standard, please obtain a clarification from the POC given in the *International Space Station Transportation and Services Information* document found in the Explorer Program Library.



**LV-4 Is a proposal to fly our mission as a secondary payload allowable as a SMEX proposal, as opposed to a mission of opportunity? I do not think we can fit under the MO cost cap of \$35M.**

Yes. See Section 4.2.1 of the AO. "Other options that may be proposed are as a secondary or co-manifested payload on commercial missions and larger ELV's such as a Delta II. NASA particularly encourages co-manifested teaming with other NASA-funded missions."

Note: "If the proposed launch opportunity is a secondary or co-manifested payload on an ELV, the proposer must identify the opportunity and provide evidence that the launch service provider is aware of the launch requirement, is supportive, and will pursue manifesting the investigation. If the investigation is selected for a Phase A, the proposer must provide evidence as part of the concept study report that the launch service provider agrees to manifest the investigation."

**LV-5 There are different versions of the Taurus. At the SMEX Preproposal >briefing, a cost of 47-48M\$ was listed for the Taurus. Does that cost apply to all versions of the Taurus? Specifically, the Taurus 3213 with a 92 inch fairing might be suitable for our payload. Does that cost 48M\$?**

The T 3213 is a Taurus 3210 that is an XL with a Star 37 upper stage. It is conceptual only and not currently available to KSC on the SELVS contract. The baseline Taurus XL is to have first flight late this year early next.

NASA does not have official costs for basic XL, not counting upper stage but Orbital Science Corp has said publicly that XL would not be more than "a few" million more for substantial performance increase. These prices were NOT quoted in AO. KSC only gave guaranteed launch service prices for rockets on contract.

**LV-6 It appears that a Taurus launch from Kwajalein is an option under the SELVS-KSC contract, but which wasn't specifically priced out for the current SMEX AO. Is it possible to get pricing for this launch?**

Updated SMEX AO charts should be available on the SMEX web site (under "clarifications"). NASA is quoting Taurus only, not XL, since XL is not on our contract. Depending on your spacecraft risk category, XL may not be certified for use as there may not be enough customers/missions by your need date.

## **INTERNATIONAL SPACE STATION (IS)**

- IS-1 Since the SMEX AO intends to offer launch in the 2007-2008 timeframe, what was the ISS payload that will be on the S3 Truss that would potentially be replaced by a SMEX AO Full Truss payload and what is its schedule?**

The Alpha Magnetic Spectrometer (AMS) payload is currently scheduled to go up to the ISS in Oct 2005. They have a cryogen that is expected to be depleted in about 3 years, hence in Oct 2008, they are tentatively planned for return. Of course, as always, schedules can change and on-orbit performance can change things too. One other possibility is that the other zenith S3 site could be used for a full truss payload if HQ chooses to do this and not wait until AMS comes down. The payload proposers should not worry about how HQ will do this. You should be bidding on the dates stated in the AO.

- IS-2 What effect will the tragic loss of Columbia have on the SMEX AO? In particular, is NASA still soliciting proposals for ISS-attached payloads that are launched on the Space Shuttle?**

NASA Administrator O'Keefe has directed NASA to proceed with all activities that are not directly linked to the Shuttle program or to the mishap investigation. The Office of Space Science is proceeding with the SMEX AO. No changes are currently being made to the AO as a result of the Columbia tragedy.

- IS-3 Does the Feb 5 amendment to the SMEX AO include ISS attached payload missions or is it just Shuttle missions that do not include ISS attached payloads?**

The only Shuttle missions solicited in the SMEX AO are ISS-attached payloads. This amendment makes the AO consistent with the Shuttle costing document in the library.

- IS-4 Does the Feb 5 amendment mean that experiments proposed for the ISS will no longer be considered for this AO?**

No. It means that the cost of Shuttle launches to the ISS is not GFE, i.e. not guaranteed. The costing policy is explained in the Shuttle Transportation document in the Explorer library. You have to lien your proposal budget for the Stage 1 proposal, and then establish the actual cost in Phase A to be consistent with agency policy for the cost of Shuttle utilization.

**IS-5** In the *SMEX International Space Station Payloads Transportation and Services Information* document in the SMEX AO library, the cost for Shuttle launch services is stated as "from 10% to 20% of the mission cost cap". Does "mission cost cap" refer to the actual proposed cost of the mission or the \$120M/\$35M cost caps for SMEX/MO proposals?

In the *SMEX International Space Station Payloads Transportation and Services Information* document, the mission cost cap that is referred to is the AO specified mission cost cap. The cost for Shuttle launch services should be calculated as a fraction of the mission cost cap, not of the actual proposed cost of the mission. For a SMEX proposal, that would be 20% of the \$120M cost cap.

**IS-6** When can EXPRESS Pallet attached payloads be placed on the ISS?

The latest (pre-Columbia) ISS planning schedule indicates that the nadir-pointed EXPRESS Pallet #1 would be available in 2006, and the zenith-pointed EXPRESS Pallet #2 would be available in 2008. Note the following cautions. All launch dates are pre-Columbia, and date of resumption of shuttle flights and impacts of loss of Columbia orbiter are unknown at this time. Funding for EXPRESS Pallets has not been finalized yet. Delays in funding commitments could lead to further EXPRESS Pallet delays.

**IS-7** What is the impact of the uncertainties in the Space Shuttle/ISS program on ISS attached payload proposals?

No change has been made to the AO due to uncertainties in the Space Shuttle and ISS programs. Proposals are being solicited against the most recent, pre-Columbia ISS schedule. It is impossible to anticipate how these uncertainties will impact ISS attached payload proposals in the future.

**IS-8** Will the TMC evaluation include Space Shuttle/ISS program uncertainties in their overall risk assessment of ISS attached payloads, or will that be dealt with at the policy level?

No. Programmatic uncertainties are not assessed as part of the TMC evaluation. The TMC peer review will evaluate proposals against the criteria given in Section 7.2.4 of the AO. Programmatic uncertainties are considered by the Selecting Official.

**IS-9 Is the cost of the Shuttle ride that will be developed during the Phase A concept study a commitment on the part of NASA for the actual cost?**

At this time, it is NASA's intent that the costs in question, which are for Shuttle launch services and standard services associated with the transportation and attachment of an ISS attached payload, will be treated like ELV costs. NASA will make a commitment to the costs that must be accounted for within the project's OSS cost cap.

**IS-10 Given that the Office of Space Science has not previously selected an ISS attached payload, what is the likelihood that such a proposal will be considered and selected in response to this AO?**

The Office of Space Science would not solicit ISS attached payloads if we were not prepared to select an appropriate proposal proposing to take advantage of an appropriate ISS opportunity. However, in a cost capped program like the Explorer Program, the risk that an investigation can be completed within the proposed budget is always a consideration. The goal of the Explorer Program is to maximize the science within the available program resources. Depending on the ISS schedule for assembly and utilization, an appropriate ISS attached payload could contribute to that goal.

**IS-11: What is the allowed upmass of a "full-truss" ISS payload as a standard shuttle launch cost?**

The SMEX AO does not specify a maximum mass or volume. In determining the rule-of-thumb for the Shuttle launch cost lien (20% of the mission cost cap), it was assumed that the launch requirements would be no more than 1/4 of the Shuttle bay in volume, and no more than ~7000 lb in weight.

Shuttle up-mass has been the most precious resource in ISS utilization planning for the past several years and that is expected to continue through 2007-2008. Realistically, the Shuttle program has a better/easier chance of manifesting a selected ISS research payload when it is smaller and lighter. It is expected that, in the future, NASA will be looking very closely at any payload that uses more than 1/4 of the cargo bay and ~7000 lb of Shuttle upmass. If a proposal exceeds these limits it will still be considered, but since the "manifestability" rapidly decreases above these limits, this factor must be taken into consideration during proposal selection.

**IS-12: What do the standard shuttle launch costs provide? Specifically, does it cover the launch and retrieval of ISS payloads?**

The 20% ROM for the stage 1 proposal, and the more accurate cost that will be determined as part of a Phase A concept study, includes standard services associated with transportation, installation, and return to Earth of a ISS attached payload. Any mission unique services required beyond the standard services, such as astronaut EVA activities, must be costed above the 20% ROM. If you have a mission unique requirement, or you are not sure if your requirement is mission unique or standard, please obtain a clarification from the POC given in the International Space Station Transportation and Services Information document found in the Explorer Program Library.

**IS-13: What is the cost of the TReK system that interfaces a payload unique control center with the MSFC POIC? Does the cost include maintenance and upgrades? If a payload developer wanted to develop their own interface system, is there a document (like an Interface Control Document) that defines the interfaces that the developer would need to know to properly interface with the POIC?**

The *International Space Station Research Opportunities* document in the Explorer Program Library provides a general reference to the MSFC TReK system and a URL to access unique TReK information. This reference includes contact information for TReK personnel at MSFC.

TReK software is distributed to the ISS community without charge. The only requirements are the minimum PC requirements to host it on (which are outlined in the TReK website referenced above) and a user procured electronic connection (science networks or whatever) to the POIC. The purpose of TReK is to relieve the scientist of the burden of programming to the extremely complex command, telemetry and database interface to the POIC. A PC running TReK can either be used to perform all functions right up to the user display, or it can be used for as little as decommutating the data and forwarding it on to another user processor.

The user should evaluate the required hardware against already available systems at the user's site. It may be possible that no new hardware is needed. The TReK software will continue to be maintained by MSFC and free updates provided as they become available. It is up to the user to integrate the TReK software into his ground system.

The payload developer is not required to use the TReK software if they wish to develop their own. The document used to define this interface for development purposes is called the Payload Generic User Interface Definition Document (PGUIDD). Due to security reasons, this document is not currently available on the MSFC POIC website. A copy of this document (apparently it is huge) can be obtained by requesting it via an email to Bryce Diamant at [bryce.diamant@msfc.nasa.gov](mailto:bryce.diamant@msfc.nasa.gov).

**IS-14: What are the various carriers that the ISS may use to take payloads or ORU's up to the ISS via the shuttle?**

A detailed list of the external carriers that the ISS Program may use, including the Unpressurized Logistics Carrier (ULC) is found at:

<http://iss-www.jsc.nasa.gov/ss/issapt/extcar/Hardware/Hardware.html>

**IS-15: For a full-truss ISS payload, is the standard EVA Contingency for unlatching a full-truss payload capture bar included or is this an optional training requirement?**

The payload developer of an ISS Full-Truss payload is required to design the payload to be EVR (robotics) install/remove. The payload is mechanically attached to the ISS truss via 3 guide pins (which mate to the ISS guide vanes) and a capture bar (which mates with the ISS capture bar assembly). The payload developer is required to design their capture bar to be EVA releasable in the event the normal EVR release fails. There is no standard design for the releasable mechanism of the capture bar, which makes this a payload unique design item.

The payload customer will be required to support interface verification tests demonstrating the elimination of preload on the capture bar and its subsequent release and reinstall and other inspections and analyses as required in SSP 57003, Attached Payload Interface Requirements Document. At this time there is no defined policy regarding crew training of the payload unique capture bar release mechanism. However, depending on the complexity, it would be reasonable to expect the payload developer to provide appropriate support for crew training including a training mockup. It is not expected at this time that the payload developer would be required to fund crew training of this standard requirement if capture bar designs are simple or very similar to past designs. If non-standard EVA tools are required, then it is expected that the payload developer would have to provide these.

**IS-16 Are there any mission duration limits on the use of ISS full truss sites?**

A proposal must propose the baseline mission duration required to accomplish the proposed science objectives for the investigation. The baseline mission duration must be scientifically justified. A longer duration may be proposed, either as part of the baseline mission or as a science enhancement (i.e., an extended mission as part of Phase F).

For the ISS, attach locations are a constrained resource. This is especially true of the full truss sites. There are other candidate users of the full truss site beside a SMEX investigation. Three-year attach durations are assumed in nominal ISS schedules. Of course, the ISS schedule and Shuttle manifest is uncertain. Nevertheless, mission durations of longer than three years must be scientifically justified, and the requirement for such constrained resources will be a factor in both evaluation and selection.

## **INTERNATIONAL PARTICIPATION (IP)**

**IP-1 Can you please confirm that the SMEX program allows for NASA funds to cross the Atlantic to purchase mission hardware, provided NASA funds do not pay for a non-US launch, and the foreign contractor follows all applicable NASA and Federal regulations?**

NASA funds may be used to purchase hardware and or services from foreign vendors, with several exceptions. The AO states (Section 3.7.1), "The direct purchase of supplies and/or services that do not constitute research from non-U.S. sources is permitted except that NASA is precluded from purchasing non-U.S. launch vehicles, nor may NASA funds provided to a mission team be used to purchase a launch vehicle from a non-U.S. source." Note also that the AO states (Section 3.7.1), "Proposers are advised that a contract or subcontract by a U.S. team with a non-U.S. participant using funds derived from NASA must meet all applicable NASA and Federal regulations. Proposers are further advised that these regulations will place additional requirements on investigation teams that must be explicitly included in discussions of the investigation's cost, schedule, and risk management."

**IP-2 We are aware that some foreign agencies have not been able to fulfill their existing commitments to NASA for contributions to NASA missions. Has this soured NASA's view on foreign contributions? What exactly is NASA's policy?**

The AO states "participation by non-U.S. individuals and organizations as team members in Explorer investigations is welcomed" (Section 3.7.1). It goes on to note that, "Such participation can add to management complexity and risk, however, and proposed cooperative arrangements must offer significant benefits while maintaining clear technical and management interfaces. The proposal must discuss the risks and benefits of proposed cooperative arrangements, as well as management approaches to mitigating these risks."

One of the risks in relying on contributions from a foreign partner is the risk that, for whatever reason, the partner may not be able to fulfill its commitment. The proposal must discuss how this risk will be mitigated. The required letter of endorsement from the appropriate government funding agency (Section 3.7.3) can contribute to the discussion of risk mitigation.



**IP-3** Section 3.7.3 states “... non U.S. institution and/or government officials ... will pursue funding for the investigation if selected by NASA.” Appendix H states “... sufficient funds will be made available to undertake the activity as proposed.” This appears to be a contradiction, and the Appendix H version sounds like a requirement that the foreign agency provide a commitment at the step 1 proposal stage, something we understand is not possible without an MOU or LOA. What is requirement for Letters of Endorsement from foreign funding agencies?

An MOU or an LOA is not required for a foreign agency to make a commitment. A commitment is made as a prerequisite for drafting and signing an MOU or LOA.

Section 3.7.3 of the AO is correct for Stage 1, and it takes precedence over Appendix H.

**IP-4** Can a non-U.S. scientist be the PI?

Yes. There are no limitations on the nationality of the PI, whether the proposing institution is domestic or foreign. However, as provided in Section 3.7.4 of the AO, export controls and regulations may apply in certain circumstances where the PI is a foreign national. Appendix 4 of the proposal must include a discussion of compliance with all applicable regulations (see Appendix B, Section I.4 of the AO). Please note that, as prescribed in Section 3.7.1 of the AO, NASA does not provide funds to non-U.S. institutions for the purpose of performing research.

**IP-5** If a non-U.S. company, not supported by a foreign space agency, partners as the prime subcontractor with a U.S. PI, would there be restrictions on the monies that could flow to the non-U.S. company?

As stated in the response to question IP-4, NASA does not transfer funds to non-U.S. entities for the purpose of conducting research. As stated in section 3.7.1 of the AO, this policy does not preclude a U.S. institution from acquiring supplies and services other than research (and except for launch vehicles and launch services) from foreign sources using NASA funds. These supplies could include the instruments, the spacecraft, and the ground system, for example. We do not consider a supplier that is not performing research to be a partner or team member of the PI's institution.

**IP-6 Could a non-U.S. PI partnered with a non-U.S. industrial team, and not supported by their domestic space agency, bid directly to NASA in response to this AO? Or is a foreign country's space agency's participation in the mission, on a non-exchange of funds basis, a pre-condition for the participation of the PI and/or industrial team?**

Yes. A non-U.S. institution working with a non-U.S. industrial team may submit a proposal in response to this AO. However, as stated in the answers to questions IP-4 and IP-5, NASA funding will not be available to such a proposing entity. Alternate funding sources will be necessary. NASA has no requirement that the alternate funding source be the space agency of the country in which the proposing entity is located, although it has been NASA's experience for the space agency to sponsor such research.

**IP-7 I have a question concerning section 3.7.3 on Letters of Endorsement for International Participation. I have 2 Co-I's at foreign institutions who will be doing data analysis ONLY. As I read the AO, they are required to submit a letter of endorsement from their institution acknowledging their participation. Also, for budget purposes, we must ask them to state the monetary value of their contribution so we can summarize foreign contributions. However, their salaries are paid by their institutions and they are free to work on whatever science they want. So they don't know their fully loaded costs, as they have never had to write proposals (lucky them). Moreover they don't see the necessity of getting a letter of endorsement since no funds are required on their part! The argument is that their system is different than NASA's. I can't just throw them out as Co-I's as they bring lots of value to the science. Can you provide any guidance beyond the words in the AO?**

Read the definition of Co-I in Section 3.5.2. If they are Co-I's, then you have to guarantee that they will be funded. Without an LOE, NASA has no reason to assume that they will be supported to do what you propose that they do. Since they are Co-I's, you presumably can't do the mission without them (read Section 3.5.2 very carefully). Why should NASA select a mission that can't be done?

Short answer: You must follow the AO requirements. They make sense.

**IP-8a Is it possible to get an interim LOA in place during the study phase or do we have to plan to carry on without such agreements? We assumed we could arrange for interim LOA's in about 3 months, starting with selection for phase A.**

Read the last paragraph of Section 3.7.5 in the AO. We do not expect to conclude agreements during Phase A.

**IP-8b There's nothing there about Interim LOA's. Could one of these be arranged in 3 months?**

The only difference between an Interim LOA and an LOA is that an Interim LOA is followed by a final LOA or MOU. It takes exactly as much work and time to establish an Interim LOA as a final LOA. So, no.

**IP-9 In Appendix I-4 and I-5, proposers have to supply a "Draft International Participation Plan - Discussion on Compliance with U.S. Export Laws and Regulations" and a "Outline of Assignment of Technical Responsibilities Between U.S. and International Partners." Should the PI be the one that negotiates the TAA with any foreign partner (with assistance from NASA HQ) even if he/she has a University partner acting as the functional interface with the foreign partner?**

International collaborations can be formed in many ways. For a PI-class mission like an Explorer, NASA expects the PI to arrange for his/her international partners and to negotiate their roles and responsibilities. The PI should determine who in the collaboration negotiates these arrangements. These arrangements should clearly be spelled out in the proposal and its appendices. NASA will evaluate the appropriateness of these arrangements as part of the proposal evaluation. As described in Section 3.7.5 of the AO, NASA will arrange for an international agreement should the proposal be selected.

**IP-10 We see no address specified for letters of endorsement. Please confirm that such letters, including those from agencies in foreign countries, should like the proposal itself, be sent to the address on p. 36 of the AO:**

That is correct. A copy to me would be helpful, but is not required.

## **MISSIONS OF OPPORTUNITY (MO)**

**MO-1 Our Mission of Opportunity proposal will involve using the Deep Space Network. The Program Libraries for Discovery and Mars missions include a document that indicates how DSN costs are to be estimated, but previous Explorer program libraries do not consider DSN charges. How should I estimate the DSN charges?**

The *Mission Operations and Communications Services* document in the SMEX Explorer Program Library also includes costing for DSN. Costs should be the same as for Discovery and Mars Scout.

**MO-2 Section 5.5 of the AO says that we must "not propose hardware" for a new science mission extension proposal. Our new science mission extension will require some small purchases of ground support equipment in order to properly calibrate and interpret the space-based data. Is this allowed?**

That sentence says "The proposal must ... not propose any hardware ... modifications to the spacecraft." This does not prohibit purchasing new ground support equipment. The situation that you described would be compliant with the AO.

**MO-3 Under what conditions could a Mission of Opportunity be selected without first completing a Phase A concept study? (5.1 Missions of Opportunity Background and Constraints)**

It is up to the Mission of Opportunity proposer to identify conditions that require selection prior to the completion of a Phase A study. NASA may or may not find these conditions sufficient.

**MO-4 I had a question about how NASA would like to fund a new science extended mission. As I understand it, for a normal extended mission, there is essentially no funding available until the prime mission ends. However, the work needed to show that the mission ops costs can be reduced for the extended mission can be funded out of prime mission funds. For a New Science Extended Mission, however, this money must come from the funds for the extended mission. I worry, however, that NASA may not want to supply funds for the extended mission very much in advance of the end of the prime mission. Since you haven't had to deal with such a situation before, and since I'm unclear on whether other new science extended missions would have similar requirements to the one I'm going to propose, I suspect that this might be something to be handled on a case-by-case basis. Perhaps, we should plan to work out a reasonable funding profile in a phase A study - if we are selected.**

The philosophy for Explorer AO's is that the PI knows better than NASA how to do his investigation. We do not specify how we want to fund your investigation because it is your investigation. It is up to you to tell us how you will get operations costs down. Make your best offer, we will decide whether we like it or not.

You are correct about normal extended missions. That is irrelevant.

I suggest that you not worry about what NASA may or may not want to do. You should write a proposal that is responsive to the AO. That means:

- Propose the right budget in the right years.
- Justify it.
- Refine it in Phase A.
- Meet all AO requirements.

**MO-5 For my Mission of Opportunity proposal for a New Science Mission Extension, I'm not entirely clear how to define phases B, C/D, and E, and I don't think that there is a clear definition in the AO. Is there some particular definition that I should use, or be guided by? Or should I feel free to define what is included in phase B, C/D, and E.**

The Phases of a NASA mission are defined in the last paragraph of Section 1.1 of the SMEX AO, and by reference in NPG 7120.5B, *NASA Program and Project Management Processes and Requirements*. By the definitions there, everything in your proposal is Phase E, although some of your pre-launch development and testing would be considered Phase C/D if you were proposing a prime mission. Since you are proposing a new science mission extension, everything in your proposal is considered Phase F as defined in Section 3.3.2 of the AO. Some of your Phase F costs may be incurred prior to launch (Section 3.3.2, paragraph 2).

**MO-6 I am submitting a Mission of Opportunity (MO) proposal for a New Science Mission Extension. I believe that the cost table B-4 is required for MO proposals, but for our proposed new science mission of opportunity, we could plausibly classify virtually all of the costs as Phase E MO&DA costs. I am tempted to change table B-4 around a bit to make it more useful for our particular mission. For example, I'd like to split the MO and DA categories and include DSN charges separately from MO. Is it ok to modify table B-4 in this way, or should I keep table B-4 the way it is and just add another table.**

All of your costs should be classified as Phase F (see previous question) except for the work that you will do during any competitive Phase A. You should add appropriate lines to Table B-4 using the existing lines for Phase C/D and Phase E as models of the type of granularity that we are looking for. The categories that you propose are acceptable.

**MO-7 I am submitting a Mission of Opportunity (MO) proposal for a New Science Mission Extension. Because the prime mission team is preoccupied with the prime mission, I am having problems getting a real mission operations cost for our proposed mission extension. Can I ask for funding for a Phase A study during which I would determine the cost of mission operations?**

No. The Explorer Program is competitive, where multiple proposers vie for a limited amount of funding. The AO notes that (Section 7.4.4), "The overriding consideration for the final selection of proposals submitted in response to this AO will be to maximize scientific return within the available budget." You are required to provide a best estimate of your costs as part of the proposal as well as provide justification for why you believe that cost (see, e.g., Section 7.2.4 and Appendix B, Section G). Recognizing that it might not be possible to obtain perfectly accurate costs while conducting a pre-Phase A proposal activity, the costs are allowed to change during the Phase A study prior to the PI making a final cost commitment to NASA. Section 5.6 of the AO states, "During Phase A, the NASA cost shall not increase by more than 20% from that offered in the original proposal and must not exceed the NASA cost cap. Thereafter, cost shall not increase from that offered in the proposal resulting from the Phase A concept study."

## **ENHANCED SCIENCE OPTIONS (PF)**

### **PF-1 Who funds Guest Investigator Activities, NASA or the P.I. team from their MO&DA budget?**

The AO states (Section 1.1) that Explorer proposals “must be for investigations encompassing all appropriate mission phases.” All activities associated with an Explorer proposal must be included in the proposed budget. That includes funding for guest investigators. It is up to the proposers to specify the proposed method of funding; the AO states (Section 3.3.2), “The proposal must define and describe any proposed science enhancement option.” The proposal should specify how guest investigators will be funded; guest investigators might be funded by NASA issued grants, through subcontracts from the PI institution to the guest investigator, or by grants issued by a participating institution (if a participating institution has the authority to issue grants). NASA reserves the right to either accept or modify the proposed funding mechanism if the proposal is accepted.

### **PF-2 Who runs the G.I. proposal process?**

The AO states (Section 3.3.2), “NASA reserves the right to solicit and select all participants in such programs.”

### **PF-3 Are guest investigator activities automatically regarded as a Phase F activity? In other words can one have a Phase E guest investigator program?**

One may propose a Phase E guest investigator program. A Phase E guest investigator program would be considered a part of the baseline science investigation. The cost of a Phase E guest investigator program must be included in the baseline investigation budget, within the NASA OSS Cost cap.

### **PF-4 Who pays for Phase F? Is it the SMEX program, or does the money come from OSS, from the relevant science theme?**

NASA pays for Phase F unless it is contributed.

## **MISCELLANEOUS (M)**

- M-1 Regarding section 6.3.2 Quantity and Media. In the 2nd paragraph, it requests that the budget tables be submitted on the CD in a tab-delimited text file. This can be done, however, you lose all formulas that were in the file when it is in Excel™. I was just wondering the reasoning behind the request to make sure that's what was really wanted.**

The budget tables are requested in a tab-delimited file because there is no requirement that the reviewers use Excel™. Any spreadsheet software can handle a tab-delimited file.

- M-2 Are backup ground stations required or recommended?**

There is no explicit requirement in the AO for backup ground stations. For every aspect of formulation, development, launch, and operations (not just ground stations), the proposal should identify appropriate mitigations and resources to address areas of risk. The Explorer Program Scientist declines the opportunity to make a recommendation on this specific technical question.

- M-3 Section 6.3.2 Quantity and Media seems to imply that NASA is requesting 56 CDs along with the original and 55 copies of the proposals. Can this be true?**

Yes, it is true. And it is more than implied, it is required.

- M-4 Should an approved Explorer be non-confirmed or terminated, will NASA consider selecting more than 4 missions for Phase A concept studies and then consider advancing more than 2 missions into Phase B?**

Probably not, but it would be pointless to speculate.

- M-5 Does NASA want the appendices included in the PDF file of the proposal, i.e., do you want us to scan in the Letters of Endorsement?**

Section 6.3.2 of the AO requires that you submit "an electronic version of the proposal in a single file." Yes.

- M-6 Is there a requirement for past performance data in the proposal?**

No. The discussion of past performance data at the preproposal conference referred to the Phase A Concept Study Report (see Section 7.4.4 of the AO). However, past performance may be used as one component of the cost validation methodology (see Appendix B, Section G of the AO).



**M-7 Could you please confirm that there is no page limit for Section G, Cost and Cost Estimating Methodology?**

The body of Section G, Cost and Cost Estimating Methodology, must be contained within the 20 pages allotted for Sections E-G (Mission Implementation, Management and Schedule, and Cost and Cost Estimating Methodology). Supporting tables, including the required Tables B-3, B-4, and B-5, as well as the optional Master Equipment List, Work Breakdown Structure, and WBS Dictionary, do not have to be contained within the page limits. See the table on page B-2 of the AO.

**M-8 The AO encourages proposers to submit a Master Equipment List (MEL). It also states that only the appendices explicitly listed in the AO are allowed, and that does not include an MEL. Is an MEL appendix allowed, or should I include it at the end of Section G (Cost and Cost Estimating Methodology), or some other location?**

The optional MEL may be submitted as part of Section G, Cost and Cost Estimating Methodology. It does not count against the page limit (see Appendix B, Section G).

**M-9 How many Notices of Intent (NOI) to propose did you receive?**

We received the usual number of NOI's. If I post a number it will be misleading. I have received several NOI's since the deadline. I have also had several people tell me that they intend to submit a proposal even though they did not send me an NOI. (I liked it better when NOI's were required.) I have had several people tell me that, although they sent in an NOI, they do not intend to propose. I expect about the same number of proposals as the last few rounds of Explorer. The number of proposals submitted appears to fluctuate by less than 20%.

**M-10 Is there a commitment on the part of OSS that unused reserve will be retained by the PI for science in Phase E?**

There is no commitment. There is a general policy that, if a project comes in under budget for Phases A-D, then some fraction of the underrun can be applied to Phase E. That fraction can be up to 100%, but must be negotiated.

**M-11 Is the 4-5 month period of time from April 2004 when Phase A Concept Studies are due to August 2004 when downselections are announced considered an extended Phase A and subject to Phase A funding limits?**

Phase A ends when the downselection is made (the downselection serves as approval to enter Phase B). Therefore those 5 months are part of Phase A. Your Phase A funds are capped.

**M-12 We've got a question regarding the 1-2% of total budget for E&PO. If I take a simplistic approach to this I just subtract the cost of my ELV from the cap and take 1-2% of it. If I think about it more, I come up with the question of "does total budget mean before or after contingency is added?"**

Simplistic is correct. Total budget means total budget -- including contingency.

**M-13 The appendices of the proposal include resumes and letters of endorsement that sometimes do not come in convenient electronic formats. They can, of course, be scanned into an electronic format, but these scanned copies are just bitmaps so they do not facilitate any electronic searches. Furthermore, it has been my experience in the past that these scanned documents often end up with very poor resolution so that they are difficult or impossible to read (perhaps because they have to be converted from one format to another). If only paper copies were required, it would probably be best to just submit direct photocopies of the original. Is it really necessary to have all the appendices in the electronic copies? And if so, is it necessary that the paper and electronic copies of the appendices be identical?**

Yes, it is necessary that the digital and paper copies be identical. And it is required.

**M-14 Do the proposed Baseline and the Minimum Mission requirements apply to Missions of Opportunity experiments?**

No. Section 4 (including Section 4.6) applies only to Explorer missions. The requirements for Missions of Opportunity are given in Section 5. A Mission of Opportunity is only required to propose a baseline mission (though there is no prohibition to proposing a minimum mission if the proposer believes that this makes sense). However, minimum science requirements for accomplishing the science objectives must be discussed (see Appendix B, Section D).

**M-15 On the online cover page, there is a request for "NASA OSS cost" and "Total Cost." Is this the capped cost followed by the total including Phase F, or is it the NASA OSS cost including Phase F with the total including contributions?**

"NASA OSS cost" is the NASA OSS cost including Phase F ("Total NASA OSS Cost" in Table B-3 or B-4). "Total Cost" is the total mission cost including Phase F and contributions ("Total Mission Cost" in Table B-3). Due to the ambiguity, the same totals excluding Phase F will also be accepted on the cover page. In all cases, Tables B-3 and B-4 provide an accurate and unambiguous proposal summary budget.

**M-16 Should the reporting of dollars on tables B-3 and B-5 be rounded to the nearest thousand or not? I could not locate a specific reference in the AO and just want to be sure I present the dollars in the correct format.**

The dollar values in Tables B-3, B-4, and B-5 may be presented with as many significant digits as the proposer believes is appropriate.

**M-17 How are tables B-1 and B-2 to be handled, i.e., are they part of the 20 page sections E, F, and G, or are they just before tables B-3, B-4, and B-5 and therefore not included in the page limit?**

(i) Tables B-1 and B-2 are not required tables. They are examples of requirements traceability matrices. The AO says (Appendix B, Section D.2), "The required "science objectives-to-measurements-to-mission traceability" may be provided either in narrative or tabular form." (ii) Tables B-1 and B-2 are not part of the implementation, management, schedule, cost, or cost estimating methodology sections (Sections E, F, and G). If they were used, they would be part of the science investigation section (Section D). So, if they were used, they would be included in the 20 pages allotted to Section D: Science Investigation.

**M-18 Does a PI need a letter of endorsement from his/her home institution (or NASA Center) or is the signing of the cover page by that institute's official sufficient to meet the AO requirements?**

The signing of the cover page is sufficient for the PI institution. However, there is no prohibition against the PI institution providing a letter of endorsement. If the PI institution is providing a contribution, then a letter of endorsement explicitly stating the contribution is required.

**M-19 We were trying to complete the SYS-EFUS cover page and when we answered "yes" to question #10 "U.S. Government Participation"; the system then displays the following:**

"The following is an excerpt from NASA's 2003 NRA Proposers' Guidebook (page 2.4) U.S. Government Agency Participation: a Yes/No designation of whether the proposal involves participation by any personnel employed by any agency of the U.S. Government, including any of NASA's Centers and the Jet Propulsion Laboratory. If the answer is "Yes," provide the participant's name, role (see Section 1.4.2 above in this Guidebook), Government agency affiliation, and total dollar amount requested (if any) for their participation in the proposal. Note that all costs for this participation must also be shown in the Budget Summary (see below), as well as be supported by appropriate details in the proposal's Budget Details (see Section 2.3 in this Guidebook)."

**We did not breakout the cost data this way for the proposal. Are we required to complete the above information?**

This information is provided within the cost section. It is not required for the cover page. This field will be turned off for the SMEX AO sometime today (April 23).

**M-20 Do my eyes deceive me or does Table B-4 not require listing of Contributions as Table B-3 does?**

If you have contributions, add a line Table B-4. Note that, for a partner MO, the parent mission does not count as a contribution.

**M-21 Do you want the NASA cover pages as part of the single proposal file on the CD or can it be a separate file on the CD?**

The AO says (Section 6.3.2) "It is required that the original and each paper copy of the proposal be accompanied by a compact disk (CD) containing an electronic version of the proposal in a single file." I want the NASA cover pages as part of the single proposal file.

**M-22 In earlier AO's the paper version of a proposal was the "Official" submission, while the single electronic copy that accompanied the stack of proposal as backup. Now that we're providing a CD with each copy, what medium represents the official version?**

The official version is the single signed original paper copy (see Section 6.3.2 of the AO).

**M-23** Typically, if we find spelling or small formatting mistakes we swap-out the errant pages without reprinting the entire document and wasting paper, time and money. We try our best to correct mistakes early, but sometimes errors aren't identified until just prior to shipping, which are corrected by swapping pages. Now that we're required to submit a CD with each proposal, it may not be possible, depending on how much time remains, to reproduce an entire new set of CD's. In this context, does the version of the proposal burned onto the CD have to be absolutely identical to the paper version? Can we correct minor mistakes by swapping pages without reproducing CD's?

The CD will be used to supplement the review. Reviewers may refer to either the paper or CD version of your proposal. In practice, it is not possible for me to compare the two versions and check if they are identical. In practice, either one may be used for the purpose of evaluating your proposal and drawing conclusions.

**M-24** The SMEX AO page 5 says "...Phase A study will be funded up to \$500K in real year dollars" while page 41 says "If the Phase A contract plus priced Bridge Phase option exceeds \$550K, then ..." something horrible happens. I assume that \$550K is also real year dollars. True?

Yes. All contracts are in real year dollars.